

HISTORY AND 'TREATMENT'
OF
THE MALIGNANT CHOLERA
AS IT PREVAILED
AT VIENNA,

From the 12th of August 1831, to the 15th of February 1832.

BY JOHN FREELAND FERGUS, Esq., SURGEON.

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[From THE LANCET of June 23, 1832.]

[In transmitting the following paper for insertion in THE LANCET, I beg to state that it is not to be regarded as a document containing all the various details which distinguished the epidemic to which it relates, but as merely presenting a condensed view of the most important facts observed in Vienna during the prevalence of the disease, as well as those which I noticed in the course of a journey performed in Hungary, Moravia, and Austrian Poland. Each fact has been carefully weighed, and not a particle of evidence advanced which has not been gathered from attentive personal observation. With regard to the post-mortem examinations, I may state, that of the immense number which I had the opportunity of attending, about 200 were performed with the most scrupulous care by Dr. Wagner, professor of pathological anatomy in the university of Vienna, who is justly ranked amongst the best morbid anatomists of Germany—J. F. F.]

ORIGIN AND PROGRESS OF THE DISEASE.

For some years before cholera appeared at Vienna, intermittent fevers had become more and more frequent. In the spring of 1831, an influenza reigned there, as well as over the rest of Germany. In July and August a gastric nervous fever raged with great violence; it was always accompanied with vomiting and purging, and gradually took on more and more the symptoms of cholera, at the same time that the morbid appearances in the intestines peculiar to these fevers changed into those found in cholera.

On the 10th of August a wretched woman, 52 years old, residing in the house No. 181 in the city (the houses in Vienna are numbered for the whole city, and not for particular streets), in the immediate neighbour-

hood of a house where seventeen persons had been attacked with this nervous fever, was, after exposure to wet, seized with all the symptoms of cholera; the most minute inquiries led to no source of contagion, and the person who nursed her remained quite well.

On the 13th a man in No. 185, who had had a diarrhoea for three days, from exposure to cold, was, on a second exposure, seized with cholera, and died; his body was opened, and presented the usual appearances after cholera. All his family remained well; but a man who was employed to lay out the body, who lived at No. 177, and who had chronic disease of the stomach, was seized on the 16th and died.

On the 14th a girl was seized in No. 181; she denied having had communication with the old woman, or those around her.

After these cases the disease no longer confined itself to this neighbourhood, but single cases took place all over the town, and, in the course of a week or two, in the most distant parts of the suburbs. The subjects of these cases had all been exposed to cold, or had made an error in diet; none of them had had communication with other sick, and they lived in parts of the town and suburbs at the greatest distance from each other. They were all of the lower classes.

On the night of the 14th of September (after three days of rain and wind from the W. and N.W.), it broke out in its greatest intensity in those streets in the immediate vicinity of that in which the first sporadic case was seen, and where the nervous fever had been so severe. This outbreak was as sudden as a clap of thunder; in two or three hours before and after midnight, more than 100 persons were seized.

It was at this moment only, that people of the higher ranks were attacked, and

these were almost all seized on returning from a place of public amusement. At this time, also, the greatest number of robust healthy people were attacked. The intensity of the epidemic (limited as it was in extent) seemed to have reached such a height, that a stronger constitution, and a better mode of living, were no longer proof against it, and it took place after exciting causes of the slightest kind. At this time no other disease was seen. The cholera euded quickly, in death, or in return to health; it was strong and clear; little complicated with other diseases. People of all ranks complained of loss of appetite—sudden giddiness—rumbling in the bowels—looseness of stools, which lasted from a few hours to some days—cramps in the extremities, with twitchings of the muscles; all these were most felt during the night, and especially towards morning. Afterwards it lost in intensity, and the rich and healthy were rarely attacked; the poor and sickly continued to fall before it, but the course was longer, and it generally ended in a low or nervous fever, or in those diseases to which the patient was most predisposed.

No other diseases were prevalent till about the end of October, when, after cold dry weather, rheumatic and catarrhal fever of an active character became very frequent. November, with cold damp weather, brought catarrh, with nervous fever and intermittents. At the end of this month an anasarca of the extremities attacked patients of all kinds, especially those who were recovering from cholera, intermittent fever, or scarlatina, and those who had lain long in the hospital with chronic diseases. December, January, and February, were in general healthy. The cholera crept slowly along, showing itself here and there with a little force, and then ceasing: the last case occurred in the middle of February.

This was the general course of the disease in the town; in the suburbs, and even in separate institutions, it ran the same course. After a few precursory sporadic cases, it broke out suddenly in its full force. No circumstances of change of weather, of situation, or particular communication, regulated the progress or course of the disease. It was found to reach its height under all atmospheric states; it did not spread regularly from one suburb to another, but often broke out in all its violence in parts the furthest from, and having no intercourse with, those already attacked. It did not attack always first the low and bad-built streets, but in them it was more extended, and had a more adynamic character.

In the general hospital, the first sporadic case took place on the 18th of August in a man of 68 years. He could not have been in communication with cholera patients;

none of the forty patients who lay in the same ward, nor of the nurses who attended him, were taken ill. It was not till after fourteen days that another case was seen, and this was in a ward at a very great distance from the other. From this time the cases became numerous, but they took place neither in the order in which the physicians made their visits, nor in that in which the wards stand to each other.

The ground-floor of the house No. 30, belonging to the hospital Zum Blauen Herr Gott, was fitted up for cholera patients. The second story continued to be occupied by patients affected with other diseases of every kind. The first cholera case was admitted on the 13th of August, and from this time till the end of the epidemic it was continually full of cholera patients of every variety. The second story received, as usual, patients with all other diseases. The physician made his visit to those in the second story, immediately after having seen those in the first. No disinfecting means were used, yet it was not till the middle of September that a man, after having been twenty-four hours in the second story for gastric fever, was seized with cholera. During the whole of the epidemic, only six persons had cholera in the second story, and of these only one died.

The Narren Thurm is a large tower of five stories, where the incurably insane are kept. The two undermost stories are occupied in common by the quiet and harmless, the rest of the building is divided into cells for the furious and unruly. The first case took place in the second story on the 18th of September; on the 19th a man died in the first; he was the only one, but in the separate cells the disease committed the greatest ravages, though the patients had communication with none but their attendants, none of whom were attacked. It often happened, that when two were together in a cell, one died and the other was unaffected.

The disease was very strong in the Lying-in-Hospital. Generally, when a newly-delivered woman was attacked, her child was seized and died also. However, there were some examples where the mother died and the child remained healthy. More than fifty mothers whose children died of the disease, and who continued to nurse them till the last, were not affected.

It never broke out in the great garrisons; most of the soldiers were attacked while on guard during the night. Here the very sudden changes of intensity and character in the disease were clearly and strikingly seen. On some nights only two or three were seized, and on others from eight to fifteen, every apparent condition remaining the same. It could not depend on partial

or accidental circumstances, because men on duty at very distant stations, of different nations and corps, were attacked, at the same time. Variations in the character of the disease were seen; on some days the ipecacuanha produced vomiting and reaction in the severest cases, while on others it had no effect whatever; this was in October, when the disease was most intense amongst them. Again, on other days all the patients had vomiting or hiccup, &c.

Only three medical gentlemen died of the disease, two of them at the commencement, without having seen a cholera patient. The third was attacked towards the end of the epidemic, three days after being appointed to take charge of some cholera patients.

All this seems to prove the non-existence of contagion. Indeed, till towards the end of the epidemic no person would believe in it, but then some very strong examples occurred. For instance, a man labouring under cholera was brought to the clinic of Professor Bischoff; no case of cholera had yet occurred in that hospital. In the space of twenty-four hours after the arrival of the man, eight patients who lay next him were taken ill, six of them died, as well as three men who had rubbed him. After these the ward was fumigated, and no more cases were seen in this hospital.

During the whole of the epidemic, the meteorological observations made by the celebrated Professor Baumgartner, show that changes in wind and temperature, in the nature and intensity of the electrical fluid, and in the hygrometricity of the air, had no influence on the disease; and also, that the chemical composition of the atmosphere remained always in its usual state.

PREDISPOSING CAUSES.

The *predisposing causes* of the epidemic are as little known to us as its specific ones. It does not first attack swampy unhealthy countries, nor swampy unhealthy parts in countries already affected. It does not even enter, by preference, countries where diseases which are strongly predisposing for the individual are reigning.

Linz is a large town in Upper Austria, situated on the Danube, ninety miles from Vienna. I saw here a most violent epidemic of dysentery while the cholera was at Vienna. The cholera has never yet been at Linz, but it broke out in a small town called Wels, twenty miles further than Linz, in the interior of the country, towards the Bavarian frontier. A gastric nervous fever preceded and accompanied the appearance of the cholera in Galizia, Hungary, and Vienna, and it was peculiarly destructive to individuals labouring under this

fever. Yet when the cholera was at Wels, a nervous fever with diarrhoea was very violent in all Upper Austria and Bavaria. The cholera, after raging in Wels and the country round to a distance of six miles, at length disappeared, and from that time till the beginning of March no case was seen in Upper Austria and Bavaria.

The predisposing causes for the individual are, first, the use of too little flesh meat—then, innutritious food generally—swampy countries—dirty, damp, and overcrowded dwellings—and bad clothing. The progress of the epidemic in Galizia offers the most striking example of the action of these causes.

Galizia is inhabited by Poles and Russneaken, Jews, and German colonists. The Poles and Russneaken, especially the latter, are very badly fed and lodged. They seldom taste beef or mutton, living mostly on a coarse rye-bread, cheese, butter, milk, and sometimes a little fat bacon. They live with their cattle, under one roof, only separated from them by a partition. They are very dirty in their houses and persons, and are generally serfs. The Jews are still more filthy than their neighbours the Poles; their houses are much more overcrowded. But they are generally warmly clothed, and otherwise have more of the comforts of life. They are generally employed in commerce.

The German colonists are clean, and live much better in every respect than any of the others; they are occupied principally with the arts, commerce, and farming. These three people live in separate villages, but which are often so close together as to form but one town, or “marktleck,” as it called. When the cholera broke out, about one in every eight was seized amongst the Poles and Russneaken; about one in every forty amongst the Germans. The Jews, according to circumstances, approached more to this or to that extreme.

The proportion of deaths in those taken ill, remained always much the same. At least the difference in favour of the Germans was not very marked.

Another class of predisposing causes was, various diseases:—

1st. Those of the alimentary canal, as gastric fever, and diarrhoea; those changes which are produced by the long use of ardent spirits;—chronic diseases of the digestive organs. In an immense number of cases opened after cholera, cancer, and contraction of the pylorus, polypi of the mucous coat, &c. were found. The liver had often a lardaceous appearance. Enlargement of the mesenteric glands, &c. Worms were so frequent (*lumbricus teres*) that some physicians maintained that they were spontaneously produced during the cholera.

2nd. Those of the nervous system, as nervous and intermittent fevers, madness in all its forms (but especially the furious), hysteria, &c.

3rd. Those of weakness, as cachexies of all kinds, especially scrofulous ulcers and caries, phthisis, and dropsy.

The clear and decided influence of these causes seems only to affect the extension and form of the epidemic—not its intensity and relative mortality. Cases occurred in Vienna as severe as in Hungary; and the number of deaths was nearly one-half of those taken ill. But while in Hungary every 9th man was attacked, in Vienna there was only one in 70. The only reason for the very small proportion of the sick to the rest of the population in Vienna was, the very strong and efficient measures taken to remove these causes. The streets were all cleaned; the houses of all the poor were visited, and proper food and clothing, and occupation in the open air, provided for them. Upon the whole, the proportion of the sick to the rest of the population was at least twice less than in Brünn, Olmütz, or Prague, cities which are all much smaller than Vienna, where there was infinitely less misery and poverty, and where the disease ought to have been less extended. But here the sanitary measures put so vigorously in force at Vienna were greatly neglected. In Vienna, during the existence of cholera, every person, who required it, had one shilling a day. At one period about 3000 persons were so relieved.

EXCITING CAUSES.

The *exciting* causes for the epidemic are not known. It was certainly very remarkable, that the great eruption at Vienna was immediately preceded by three days of severe cold rain and wind, after a number of weeks of very hot weather.

The individual *exciting causes* are, matters of difficult digestion, or food of good quality eaten in too great quantity, or in such haste as not to be well chewed. In the stomach of a great majority of those who died after a short illness (particularly in those of children) large pieces of food, generally potatoes or prunes, were found.

The intensity of the disease often seemed to be in relation to that of the exciting cause (that is in healthy subjects). If this was slight the patient had an ordinarily bad stomach, or he had all those symptoms described as the “prodrome” of cholera. If when in this state, or even when he was convalescent from real cholera, the patient indulged in a new excess, he was often in a few minutes seized with the worst form of cholera. This occurred very often amongst the well-fed, well-clothed, but disorderly, Hungarian soldiers. Indeed from

this cause alone there were more cases of relapse amongst the 302 soldiers who had the disease than in all the other hospitals together. Wet and exposure to cold were often given by the patients as the immediate causes of their illness. The soldiers were almost all attacked while on guard during the night.

Fear is another exciting cause of the greatest force. A Dr. Bochie was sent into Hungary to treat the cholera, where he was in a short time attacked, and died. He had left a mistress at Vienna. A brother of the diseased meeting the girl in the street, said “Your friend has died of the cholera.” The girl was much shocked, and before she reached her home she was seized with violent cholera, and died in six hours.

Going into the hospital one day, I found a strong healthy woman who had been at the moment brought in. She had just vomited a large quantity of half-digested flesh. On asking her to what she attributed her illness, she said that her master had a friend who had been taken to the cholera hospital, and that he had sent her thither to inquire how he was. As she was going along she was in great fear she should catch the cholera at the hospital; but long before she came near it she felt a sudden giddiness, became faint, and vomited. This proved a very severe case of the first form of cholera.

DIVISION OF SYMPTOMS AND FORMS.

The three following forms seem to me, by the difference in their symptoms and course, and by the difference of treatment required, to be the most natural, clear, and necessary:

1. The highest degree:—Seizure sudden; evacuations, almost or altogether wanting; cramps most severe; ends in most cases in a few hours, the action of the heart often becoming imperceptible before consciousness is lost.

2. The most common form:—It presents the greatest variations, and the most numerous succession of symptoms, which at one time resemble more those of the 1st, and at others more those of the 3rd form. Almost always a prodrome; ends fatally by paralysis, the consciousness being lost; respiration the last vital function which ceases.

3. Often no prodrome; comes on with sudden and copious evacuations. The patient sinks rapidly and silently, without any violent symptoms.

First Form.

This form was frequent only when the epidemic was at its height. Men of a firm, hard constitution, with the muscular and

circulating systems predominant, who had just reached, or were a little past, their prime, were much predisposed. The gin-drinkers who had not carried their practices so far as materially to affect their constitutions, were often affected by it. Women above 40, in these circumstances, were sometimes seized with it. It became more seldom in proportion to the distance from the above-mentioned constitution.

In general it occurred suddenly after some great excess. The patient felt a sudden giddiness, and dropped down, or he felt a tremendous pain in the region of the stomach, or a sudden stoppage of his breath. In most cases there was one or two fits of vomiting or purging at the moment of attack, or these were altogether wanting. In a few moments the severest tonic spasms attacked first the lower, then the upper extremities, and then the muscles of the abdomen, which were drawn in as flat and hard as a plank,—these were accompanied with great pain. Almost immediately the skin began to cool and to take on a blue colour, which speedily increased to an icy coldness and deep purple. The pulse, at first very irregular, became small, and then ceased, first at the wrist and then at the neck. The tongue was cold, and covered with a white crust. The voice became choleric in a high degree; the patient expressed the utmost longing for cold water; the thirst was excessive; the difficulty of breathing so great as to cause him to gasp for breath, and throw himself from one side of the bed to the other. This spectacle of anxiety and torture was really horrible. Yet during all this time the understanding remained perfect, but rolled in upon itself, the patient taking little notice of what went on around, or even of his own condition, his present sufferings seeming to absorb his entire mind. Death takes place for the most part suddenly, seemingly from the heart ceasing to act. It is almost impossible to obtain a drop of blood. Even if we open a vein at the very first, only about an ounce will flow. The stomach seems to be paralysed, as the strongest doses of ipecacuanha, even some drachms, with a large quantity of tartar emetic and other stimulants, produce no vomiting. It seldom lasts longer than from six to twelve hours. In cases of recovery, the reaction is very violent, and of an inflammatory character.]

Second Form.

This was generally preceded by a prodrome, which came on with giddiness; loss of appetite; troubled sleep; convulsive twitchings in the separate muscles of the extremities; rumbling in the bowels, like water rolled about in half-filled barrels.

But the most characteristic symptom was

a diarrhœa, or rather a looseness; this was extremely constant, and might with more propriety than any of the other symptoms be called the prodrome of cholera. It often came suddenly after an exposure to cold, or error in diet; often without any obvious cause. It is never accompanied with pain or tenesmus. The ejected matter varies from a pultaceous consistence to a fluid nearly resembling that proper to cholera itself. It is seldom that a person has more than three or four stools in a day. In regard to duration, it lasts from an hour to many days; it often ceases entirely, and begins afresh. When it lasts for many days, the person is very liable to be attacked with the third form of cholera. An immense number of persons were attacked with these symptoms, even several times, but by taking proper care, the further development of the disease was prevented.

Copious vomiting, or purging of the peculiar clear fluid, mixed with flakes of a whitish substance, and accompanied with excessive faintness, marked the passage of the above state into real cholera; in a very short time cramps came on in the feet and calves of the legs. The pulse diminished in strength and frequency; the respiration deep, and accompanied with much effort. The voice peculiarly altered; the skin cold and blue; all the various secretions suppressed; the thirst very violent. After these symptoms had continued a shorter or longer time, if the patient was strong and undebliterated, either the vomiting ceased suddenly, and he passed into the state described in the first form, or the vomiting continued, and became of a grass-green or yellow colour; the pulse rose, became full and strong, and, often, active congestions were formed to various organs. A tormenting hiccup frequently followed or accompanied the bilious vomiting.

In patients of a weaker constitution, (women, youths, children, &c.) quite another order of symptoms succeeded,—the paralytic state. The cramps and evacuations ceased; the patient lay quite still and powerless on the back; the consciousness was lost; the pupil dilated, or sometimes strongly contracted; the eyes half closed and turned up so as to show the white, which was often strongly injected on that part which was exposed to the air. The pulse rose a little, so as to be again felt at the wrist, but remained very weak. The respiration was performed at intervals by gasps; the skin was cold, and generally covered with a cold, clammy sweat, which even exuded from the pores after death. Patients in this state generally sank in a few hours by the gradual cessation of the pulse, and then of the respiration, which at

the last was only kept up by two or three convulsive gasps in the minute.

In others the consciousness was not quite lost, being more a state of stupor; the pulse increased in strength and frequency, the temperature of the skin rose, and the cheeks flushed of a bright scarlet colour. These states often lasted for a day or two, during which time they frequently (of themselves, or from means used) showed considerable changes. At one time the stupor or paralysis, at another the affection of the circulating or hepatic systems, were more predominant.

Third Form.

This occurred in people of the very weakest constitution, who were highly scrofulous, or nearly exhausted by any severe disease, especially one of a chronic nature. It came on with a sudden and copious discharge of the fluid peculiar to cholera, in greater quantity, and often exclusively per anum. This lasted a very short time, when the forces sank, the patient was seized with fainting fits, pains in the abdomen, and oppression in the breast. The features became haggard; the cramps were seldom violent, sometimes wanting, and, without the skin becoming blue or losing much heat, the pulse and strength of the patient rapidly sank, and he died without any violent symptom. This form often ran its course, rapidly, in from six to twenty-four hours; the patient often fell into a state of stupor, or imperfect nervous fever, which lasted two or three days, and then ended in death. In a few rare cases it lasted longer, and other diseases developed themselves.

PROGNOSIS.

The passage of the second form into the first, or into the state of paralysis, was always had. The forerunner of this was a sudden cessation of the evacuations. The discharge of a pink-tinged fluid per anum was a very fatal sign; a thick, cold, clammy sweat was always dangerous. When the clammy sweat broke out with a sudden development of heat and return of the pulse; it was often a forerunner of death in the paralytic state. Gradual return of the pulse, of the temperature and moisture of the skin, the occurrence of bilious vomiting, still more the return of the secretion of urine, and the passage by stool of a thick tarry-looking substance, were all signs and accompaniments of a moderate reaction and favourable termination. It was only when these were present that no other disease developed itself as soon as the cholera had ceased. Even when it terminated thus favourably, a bilious vomiting, a hiccup, returns of the diarrhoea, or an obstinate cos-

tiveness, often gave much annoyance to the patient.

DISEASES IN WHICH IT TERMINATED.

There was a regular gradation in these diseases, from a peculiar soporose or adynamic state—which was seen after the third form, and came on immediately as the symptoms of cholera ceased, and which did not show any perceptible affection of particular parts, and were therefore to be regarded as the consequence of cholera alone—up to those cases of almost pure inflammation of some particular organ, which followed strong reaction, in robust individuals. During their course, almost always typhoid symptoms came on;—they often ran their course, rapidly and silently; producing much disorganization, without evident signs of the mischief, such as full strong pulse, much heat of the skin or pain in the part. Indeed, the patient often lay without complaining, was obstinate and sluggish, would not be disturbed, and paid not the least attention to what was going on around him. It was not the strength of the patient and the particular form of cholera alone which modified these diseases. The effect of the treatment employed during the cholera itself, was very striking. When ice was used, the reaction was always very violent, and the congestions to particular organs very strong; but these were of an active character, and therefore more under the control of the physician. The indiscriminate employment of strong stimulants in large doses, such as opium, camphor, musk, ether, oil of cajeput (especially in the active forms of cholera), was followed so constantly by a dangerous soporose state, that after some time they were almost entirely neglected by all the physicians of Vienna.

Affections of the Brain.—These bore a greater or less resemblance to encephalitis; they occurred most frequently in women, almost always after the paralytic state. They often ran their course in a few days. The principal symptoms were, delirium, pain in the head, ringing in the ears, giddiness, &c. The pulse was small, sharp, and quick; the cheeks flushed of a bright rose colour.

Congestions and inflammations in the substance of the lungs were seldom attended with copious expectoration, nor did the patient complain of pain. The most characteristic symptom was the hurried and anxious respiration, and the absence of the respiratory murmur. It occurred mostly in strong men, in whom the reaction had been violent; but it was, even amongst them, of but rare occurrence.

Determinations to the intestines took place more or less in every case, and com-

plicated all the diseases which followed cholera, so that sometimes when the determinations to the brain, &c., had been successfully combated, the patient died at a later period with typhoid symptoms, in consequence of the affection of the stomach or bowels.

The termination in dropsy was rather rare; only at one period it became very general; it went off easily when the other had symptoms were overcome.

The other diseases which developed themselves after cholera, depended much on individual habit; four cases of delirium tremens were seen in hard drinkers, three died, one recovered under the use of opium. In young men there occurred several cases of epilepsy. In women, a good deal of hysteria, and in some, anomalous contortions of the body resembling chorea. In the scrofulous, the glands of the neck often swelled and suppurated. In two or three cases there was inflammation of the parotid; three cases of nephritis, &c. Acute hydrocephalus was very common in children of scrofulous habit.

MORBID APPEARANCES AFTER DEATH.

The only constant and peculiar changes which were never absent, and which were found in every form of cholera, were a specific change in the blood, and in the mucous membrane and glands of the pharynx and intestinal tube, with a corresponding change in the contents of the latter. The other changes, except perhaps the hardening of the nervous matter, seemed only accidental or secondary.

The blood was, in substance and appearance, very black, thick, and grumous. It looked as if the colouring matter alone was left, with as much serum as to make a consistency like syrup, because it was rough and grainy. A few clots of coagulable lymph were generally found in the heart. The veins of every part of the body were so distended with this blood, as to give many organs the appearance of active congestion.

The mucous coat of the intestines seemed always, in acute cases, as if swollen in its whole extent; from place to place it was of a bright red, from numerous vessels—(a consequence of inflammation or passive congestion only?). In other parts it seemed even paler than natural. The mucous membrane of the pharynx was often of a deep purple, from the injection of its vessels.

The contents of the intestines were either a thick tenacious mucus, sometimes as hard as coagulated albumen or curd (it was of a whitish colour, though tinged of a pink hue, opposite those places where congestion had taken place), or another colourless fluid quite clear resembling serum

("rice-water-like liquid"). These two substances were mixed together in all proportions, and they were tinged of all colours, from the admixture of fæces, bile, or exuded blood; so that sometimes the flakes of the first substance floated in, or sank to, the bottom of the liquid, which remained clear; at other parts they were so blended as to resemble milk, or even cream. In severer cases they were thus intimately mixed, and tinged of a bloody hue.

The thick mucus seemed, from what I have seen, to be produced first, and then the thin fluid. The thick mucus was always in relation to the enlargement of the glands; the thin fluid, to the changes in the rest of the mucus. If the patient had died after a few hours illness, the glands of the pharynx and back of the mouth, those of the intestines, from the cardia to the anus, were much, but simply, enlarged; those of Brunner were elevated above, and stood clear out from, the mucous membrane; those of Peyer were raised about half a line or a line, and their surface was uneven. They were always of a pale colour, and of a uniform texture when cut into; they stood in no relation whatever to those parts of the intestine where congestion had taken place; but they seemed to have some connexion with the production of the thick mucus, because the glands were most developed in those subjects, and in those places where this mucus was most abundant. When the contents of the canal were more fluid, these glands were no longer so distinct.

When the patient died some time after the cholera had ceased, the glands were found in a different state; they were no longer so much raised above the surrounding membrane; they were more flattened down; the separate glands had a small black spot on their apex, and often contained a thin white fluid something like pus. The aggregate ones were quite dotted with black points, some as large as a pin's head; the mucous membrane was much swollen, and the congested parts were of a darker hue. The glands of the pharynx at this time contained pus when cut into, and they often had a ragged appearance as if from the commencement of ulceration. The period at which these appearances were seen, varied very much. At a still later period, when the patient died after very strong typhoid symptoms, the mucous membrane of the stomach and bowels was covered over with a tenacious semitransparent mucus, about one line deep. It was often itself so softened as to form but one substance with it, and on attempting to remove the mucus from the membrane with the back of the scalpel, the membrane was so softened as to come away with it and

leave the cellular coat bare. At this time it was difficult to find a trace of the glands. In those places where the mucous coat was of a firmer consistence, it was often of a bright-red colour, from patches of injected capillaries, which were quite straight, about a line long, and could not be traced into the submucous coat; they looked like injected villæ. The whole mucous surface had a green-black colour, caused by the deeply injected cellular coat shining through it. This last was seen of the darkest crimson when the mucous coat was removed. This softened state of the mucous, and strong injection of the cellular coats, seemed to stand in a fixed connexion with the typhoid symptoms.

The great *nervous masses* were often found changed in cholera, but in no constant or peculiar manner. When the patient had died in a few hours, from the first form, the hardening of the nervous matter in every part was very remarkable. It was less and less as the disease had approached the third form, when a quite opposite state was often found—the brain, &c., being softened, and containing a good deal of serum. After the paralytic state, and when the patient had had symptoms of encephalitis, the brain was often much gorged with blood, and exudations of lymph of a gelatinous consistence were frequently found under the arachnoid, as well as large effusions of serum in the ventricles.

The changes in consistence, size, and appearance, in the semilunar ganglion (which was in every instance examined), were never constant, and stood in no relation whatever to the differences of the particular cases. Sometimes it was pale, sometimes red, large or small, hard or soft, &c. The medulla spinalis was like the brain, often hardened, and its veins, particularly towards its lower end, very strongly congested. The serum in the spinal canal was almost always increased. The lungs were most altered in the first form, when, in the middle of their substance, patches of a bright vermilion were found, which contrasted strongly with the very black congested state of the other parts. In some cases they were dry when cut, in others they were filled with a foamy serum. At a later period, if particular determination had taken place upon them, they were of a brown-red colour, they were uncrepitating and friable, and on cutting them much serum flowed out. The trachea and bronchia were throughout of the same colour. At this time, also, effusions of serum were found in the pleura and pericardium. The heart and large vessels remained perfectly healthy, with the exception that black spots of ecchymosis were often seen near the base of the heart. The liver, pancreas, spleen,

&c., were hard, dry, and contracted, after the first form. The gall-bladder was always filled with gall, of various colours and degrees of consistence—its ducts remained open. The kidneys were unaltered, the bladder was hard, contracted, and contained only a few drops of a dirty white urine. The serous and cellular tissues were remarkably dry in cases of short duration, and it required the greatest force to overcome the tonic contraction of the muscles—even the diaphragm and the intestines were so contracted.

TREATMENT.

Treatment of First Form.

In the most violent cases of the *first form*, all treatment whatever was found unavailing. Bleeding always produced relief, and if, by means of ipecacuanha, or other emetics, or by ice, vomiting was produced, the patient immediately found himself much better. But, in most cases, it was impossible to produce vomiting by any means, and the patients were all lost.

If those symptoms, described as the *prodrome* of cholera had come on in consequence of exposure to wet or cold, the best effects were seen, if the patient went into a warm bed, took a dose of Dover's powder, and drank an infusion of elder or camomile flowers, until full perspiration was produced. If they had been caused by an excess at the table, if nausea came on, if the diarrhœa became very frequent or copious, with cold extremities or cramps, the greatest advantage was obtained from an emetic of ipecacuanha; afterwards an infusion of the same root, \mathfrak{zj} to \mathfrak{zvj} of water, with ten to twenty drops of laudanum, a table-spoonful to be taken every hour. In a day or two, when the purging still continued, the infusion of columba was substituted for that of ipecacuanha, and the quantity of laudanum increased. Under such treatment it was very rare that these symptoms went further.

Treatment of Second Form.

If the patient was strong, the very best effects were seen from bleeding; and then the administration of a large dose of ipecacuanha, which did great service in all cases but those where, from the patient's excessive weakness, it was contra-indicated. If the first dose of one scruple did not act it was repeated, and in the interval a few grains of musk and camphor were given, which were found to assist the action of the ipecacuanha. These were continued till the temperature and pulse began to rise, and the skin to assume its natural colour. In the same circumstances the use of ice was followed with great relief. The patient received it in pieces as

large as he could swallow, and his skin was rubbed with large pieces, and afterwards well dried with rough cloths, and the patient put in a warm bed. The first effect of the ice was to produce vomiting, which was soon followed by increase of the temperature, &c. Even in cases where the thirst, cramps, and oppression of breathing, were most violent, and the skin already cold and blue, with no pulse at the wrist, a reaction was produced by the employment of these means.

Treatment of Third Form.

In this form the bleeding, ipecacuanha, and ice, did more harm than good; most benefit was obtained from opium, by the mouth, and in injection with yolk of egg, camphor, musk, and especially the infusion of arnica.

Sinapisms were found of great advantage in every form; they were applied to the calves of the legs, and to the pit of the stomach, when the cramps and pain were severe. When the abdomen was tender to the touch, leeches and warm fomentations had a good effect. Vapour-baths, hot sand, hoth-baths, were seldom productive of much good. In a few cases a warm-bath, in which caustic alkali had been dissolved, produced a reaction. Hot and stimulating frictions relieved the cramps in the extremities, but had no effect in raising the temperature.

Here then stand on the one side bleeding, emetics, ice, and sinapisms, and, on the other, opium, brandy, camphor, oil of cajeput, sulphuric ether, hot frictions, baths, &c. These last were, at the commencement of the epidemic, almost exclusively employed. But in so far as the former were found to stop more effectually the course of the disease, to produce reaction, and to give an active character to those congestions which afterwards developed themselves, the use of the latter was almost unanimously abandoned by the physicians of Vienna, except in those cases of exhausting diarrhœa, or vomiting, described as the third form of cholera; for though they sometimes put a stop to the symptoms of the disease, and even roused the patient out of those desperate states of congestion or paralysis in one or two cases, yet their use was always followed by the sopor, and the worst forms of typhoid fever. Even in the third form they were given only in small doses, never in such quantity as was necessary to produce reaction in the 1st and 2nd forms.

With the exception of the employment of ipecacuanha and ice to produce reaction, the physician must be guided by the general rules of practice, as there is perhaps no disease in which the treatment must be

more varied, according to the circumstances of the case.

Treatment of the Sequelæ of Cholera.

When the bilious vomiting and hiccup were severe and long-continued, the best remedy was subnitrate of bismuth and ext. of hyosciamus; three grains of each were given every two hours till relief was obtained. Effervescing draughts. The sulphuric and nitric acids, in decoction of salep, or althea, were often equally useful. When vomiting and diarrhœa returned during the convalescence, they were treated with success in the same way as the prodrome.

The patients were bled with the greatest advantage in those cases where the congestions were clear, and accompanied with strong reaction. In other cases, where the patients, on coming out of the cholera, fell into a state of stupor, or incomplete nervous fever, it was often difficult to determine if depletion or stimulants should be had recourse to. The one or the other was most successful, according to the individual circumstances of the case.

When the symptoms of encephalitis came on, leeches to the temples, ice in bladders to the head, and sinapisms to the lower extremities, produced the best effects. In the few cases of inflammation of the lungs, tartar emetic, &c. were employed. When the belly was painful to the touch, leeches and sinapisms were employed; these were necessary in almost every case.

When, after several days, typhoid symptoms showed themselves, such as delirium, black crust on the tongue, &c., no more good was derived from the continuance of the antiphlogistics—but, on the contrary, the most marked good effects, from small and frequent doses of musk and camphor, and opium, with infusions of arnica and valerian. When the patient remained weak, and had frequent returns of purging and inclination to vomit, the best effects were seen from an infusion of columba, gentian, cinchona, or other tonics, with a few drops of laudanum, and a diluted mineral acid. For a long time the least exposure to cold or wet, or the least excess in eating or drinking, brought on a return of the diarrhœa. The constipation, which often followed cholera, was best removed by a few doses of castor oil.

London, March 30, 1832.

TABLE OF THE RELATIVE MORTALITY FROM MALIGNANT CHOLERA IN GALITZIA,
AMONGST THE POLES AND GERMAN COLONISTS.*

PLACE.	Inhabitants.	Population.	Duration.	Taken ill in Population.	Dead in Population.	Dead to taken ill.
Flosrow	Poles	752	80 days.	1 in 9	1 in 25	3 in 8
Gergnia	Poles, &c.	414	57	1 — 7	1 — 17	5 — 8
Woloska † ...	.....	1457	90	1 — 14	1 — 27	5 — 7
Kmazalnka ..	Poles	910	65	2 — 13	1 — 13	7 — 6
Nawoselica ..	German Colony	355	26	1 — 35	1 — 177	1 — 4
Nawosyn	Poles	419	49	1 — 9	1 — 23	1 — 2
Weldsiz	Poles, Jews, &c.	1021	68	1 — 13	1 — 35	1 — 2
Pacskow	Poles	207	47	1 — 7	1 — 29	1 — 3
Solyn	Poles, &c.	356	36	1 — 11	1 — 59	1 — 4
Stizow	Poles, &c.	1227	62	2 — 19	1 — 14	1 — 2
Bolchchow	Poles	2708	114	2 — 19	1 — 33	2 — 5
Engelsberg ..	German Colony	175	—	1 — 46	1 — 92	1 — 1

In Debelawka, a German colony, two miles from Kmazalnka, there were only two cases; one died. New Babylon, a large German suburb, had only one or two cases.

GENERAL TABLE OF DEATHS IN VIENNA, FROM 1805 TO 1831, INCLUSIVE.

Year.	Summary of Deaths.	Proportion to Year preceding.		Most Prevalent Diseases.			
		More.	Less.	Nervous Fever.	Small Pox.	Diarrhœa, Dysentery, and Cholera.	Scarlatina.
1805	16,742	—	—	886	193	193	502
1806	20,359	3617	—	2163	2330	367	147
1807	13,764	—	6595	776	54	340	71
1808	14,924	1160	—	592	12	—	—
1809	20,218	5294	—	1352	123	1382	—
1810	17,445	—	2773	1963	560	—	—
1811	15,359	—	2086	733	589	—	—
1812	14,407	—	952	624	145	—	—
1813	12,971	—	1436	784	254	513	—
1814	15,309	2338	—	1529	116	909	—
1815	11,520	—	3789	433	73	357	—
1816	12,306	786	—	390	57	242	—
1817	12,742	436	—	405	8	234	—
1818	11,070	—	1672	480	47	122	—
1819	11,501	431	—	466	100	90	—
1820	10,822	—	679	442	58	119	—
1821	10,411	—	411	375	176	94	—
1822	11,828	1417	—	371	238	552	56
1823	11,160	—	668	529	92	121	—
1824	10,537	—	623	376	8	101	—
1825	10,959	422	—	439	46	132	—
1826	12,190	1231	—	496	59	344	—
1827	12,363	173	—	502	59	124	—
1828	13,764	1401	—	532	342	106	—
1829	13,468	—	296	669	256	63	—
1830	13,708	240	—	658	280	167	48
1831	16,784	3076	—	893	195	2198	131

* Given to Mr. Fergus by Dr. Flechner, Director of Quarantine at Podgorze.

+ Sanitary laws strongly enforced here.

GENERAL TABLE OF THE MORTALITY IN VIENNA IN EACH MONTH OF 1831.

January	1135	July	1087
February	1179	August	1213
March	1393	September	2087
April	1363	October	2186
May	1301	November	1464
June	1257	December	1119

GENERAL PROPORTIONS OF DEAD IN 1830 AND 1831.

	Men.	Women.	Boys under 10.	Girls under 10.	Old People, from 90 to 100.
Died in 1830	4076	3633	3131	2868	30
1831	5240	5181	3327	3036	40†
Increase in 1831	1164	1548	196	168	14

† One of these was aged 103, one 104, and one 108.

TABLE OF DISEASES TREATED IN THE GENERAL HOSPITAL, VIENNA,

From 12th of August till end of October 1831.

	Attacked.		Cured.		Died.		
	Men.	Women.	Men.	Women.	Men.	Women.	
Came with Cholera	98	134	43	55	50	66	
Fevers	22	47	9	12	13	35	{ Nervous, Gastric, Intermittent, &c.
Nervous Diseases	4	12	1	3	3	9	9 Convulsions; 3 Palsy; 3 Colic.
Inflammations ...	2	7	1	4	1	3	Pneumonitis & Peritonitis.
Skin Diseases	5	4	5	4	0	0	{ 4 Itch; 2 Scarlatina; 1 Small-Pox; 2 Tenia.
Ex. & Secretion } Diseases	25	14	6	5	9	9	{ 10 Diarrhoea; 5 Hæmoptysis; 5 Gout; 6 Obstructions, &c.
Cachexies	26	26	9	9	17	17	{ 12 Phthisis; 9 Dropsy; 6 Marasmus, &c.; Syphilis.
Insane	16	28	6	8	10	208	Of all kinds.
Surgical Diseases.	8	10	1	5	7	5	{ 12 Chronic Ulcers, mostly scrofulous; 11 of these died.
Childbed and Preg.	—	30	—	20	—	10	
Puerperal Fever..	—	4	—	1	—	3	
New Born	44	34	1	1	43	33	

			Cured.	Died.
Treated with ice from Sept. 15th, till the end of Oct.	100	.....	65	..... 35
Ditto from end of Oct. till 12th of Dec.	42	.....	34	..... 8
Ditto Stimulants, and hot frictions	292	.....	128	..... 164
Ditto Ipecacuanha alone	21	.....	9	..... 12
Ditto Ipecacuanha and stimulants	37	.....	12	..... 25
Ditto Ice and stimulants	58	.....	19	..... 29

NOTES ON THE PRECEDING TABLE.

The cholera developed itself, in most part, during the course of the fever; in a very few cases, when the convalescence had commenced.

The intermittents were almost all ter-

tians; the cholera broke out during the intermission, and did not prevent the occurrence of the succeeding paroxysm.

The cases of small-pox and scarlatina were in the last stage when attacked with cholera.

One who had the itch was taking sulphur. The syphilis is no protection against cholera, in any form. Some patients had taken mercury up to the moment of being attacked with cholera.

Dropsies disappeared during, but returned eight or fourteen days after, the cessation of the cholera. However, in one case of hydrothorax the water disappeared, and did not return.

The cholera had no effect whatever on the state of mind of the insane.

Eight pregnant women brought forth

dead children during the attack; three of them had living children during the recovery, two of which, however, died of the cholera. In seven the cæsarean section was made immediately after death, but always unsuccessfully.

In some the lochia stopped, but returned after the cholera; in others they continued to flow.

The secretion of milk was diminished in all. In some it ceased altogether, and did not again return.*

TABLE OF THE SICK TREATED IN THE CHOLERA HOSPITAL NO. 3 IN VIENNA,†

From September 18 till October 31, 1831.

Age.	Taken ill.		Cured.		Died.	
	Men.	Women.	Men.	Women.	Men.	Women.
From 10 to 20	14	10	7	8	6	2
20 to 30	20	26	12	19	8	7
30 to 40	13	16	6	7	7	7
40 to 50	14	12	6	8	7	4
50 to 60	7	11	2	2	5	8
60 to 70	6	6	3	0	2	6
70 to 80	1	3	0	0	1	3
80 to 90	0	1	0	0	0	1
	75	85	36	45	36	38
Total	160		80		74	

	Came.		Died.		Recovered.
On the 18th of September	26	....	14	....	12
19th ditto	13	....	6	....	7
20th ditto	10	....	4	....	6
21st ditto	10	....	5	....	5
22nd ditto	9	....	6	....	3
23rd ditto	9	....	5	....	4
24th ditto	4	....	2	....	2

After this the number gradually diminished, with occasional slight exacerbations.

Remained under treatment three men and three women.

Four nurses and four porters were taken ill; two of each died.

The treatment varied considerably. It consisted for the most part of bleeding, leeches, and ipecacuanha. Stimulants were employed only at the commencement. Towards the end a few experiments were made with ice, which proved its efficacy.

* Extracted from a paper published by Dr. Güntner, in the "Medicinische Jahrbuch" of Vienna.

† Under the Primar Physicians, Drs. Shifner, Reider, Czikanec, and Saxinger. Reduced from the protocols of the hospital.

TABLE REDUCED FROM THE PROTOCOLS OF DR. VIVENOT'S CHOLERA HOSPITAL IN THE CITY,
From September 15 till October 20, 1831.

Age.	Taken ill.		Cured.		Died.	
	Men.	Women.	Men.	Women.	Men.	Women.
From 10 to 20	5	6	4	5	1	1
20 to 30	5	14	4	9	1	4
30 to 40	6	10	2	7	4	2
40 to 50	6	8	2	1	3	3
50 to 60	3	6	1	2	2	3
60 to 70	3	3	0	0	2	3
70 to 80	0	1	1	0	0	1
Total	28	48	14	24	13	17

	Came.	Died.	Recovered.
On the 15th of September	2	0	2
16th ditto	9	4	...
17th ditto	28	16	12
18th ditto	12	5	7

After this the epidemic diminished most rapidly in this part of the town, as we see that in these three days more were seized than in the thirty following.

Remained under treatment, two men and seven women.

Four nurses and two porters were taken ill. The former all recovered; the latter both died.

The treatment was very antiphlogistic—viz. bleeding, leeches, acids, ipecacuanha, and sinapisms. Stimulants were seldom, and then sparingly, used, &c. Ice I believe never.

IN THE MILITARY HOSPITAL FOR CHOLERA.

	Patients arrived.	Recovered.	Died.
During Sept. ..	100	55	45
Oct. ...	169	112	57
Nov. ...	33	23	10
	302	190	112

From 5th till 17th of September, of 21 treated with stimulants, 7 recovered, and 14 died. After this they were treated almost exclusively with ipecacuanha and moderate warmth during the cholera; with bleeding, leeches, and sinapisms during the reaction; and with large doses of musk, camphor,

and punch, when the patient fell into typhoid fever, with muttering delirium, black tongue, &c. These patients were all robust, and were attacked with cholera, mostly after having committed excesses in eating, drinking, and being then obliged to mount guard. Owing to these causes relapses were very frequent and often fatal. In two cases the patients had a return of most violent cholera, and yet escaped. No nurse was taken ill. One young surgeon died three days after having come to the hospital in the beginning of December, when instances of contagion were seen in other parts of the town.

